

国際フォーラム パネル討論2

Panel Discussion 2

13 December, 9:30-12:00

「アジアの原子力利用における核不拡散・核セキュリティ方策および多国間協力枠組み」

Measures to ensure nuclear non-proliferation and nuclear security for nuclear energy use in the Asian region and a multilateral cooperative framework

座長: Chairperson :

- 久野 祐輔 原子力機構 核物質管理科学技術推進部次長

Dr. Yusuke KUNO Deputy Director of STNM, JAEA, Deputy Director of STNM, JAEA

パネリスト: Panelists (alphabetical order)

- グレップ エフレーモフ ロシア・アンガルスク 国際ウラン濃縮センター部長

Mr. Gleb EFREMOV, Commercial Director, JSC International Uranium Enrichment Center” (IUEC), Russia

- ステファン ゴールドベルグ アメリカ芸術科学アカデミー研究コーディネーター

Mr. Stephen GOLDBERG, Research Coordinator, Global Nuclear Future Project, American Academy of Arts and Sciences

- イル ソン ファン ソウル国立大学教授

Prof. Il Soon HWANG, The Seoul National University, the Republic of Korea

- 直井洋介 原子力機構 核不拡散・核セキュリティ総合支援センター次長

Mr. Yosuke NAOI, Deputy Director, Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN), JAEA

- 田中知 東京大学大学院工学系研究科 原子力国際専攻教授

Prof. Satoru TANAKA, Professor, Department of Nuclear Engineering and Management, School of Engineering, The University of Tokyo

- ティムール ザンチキン カザフスタン原子力庁委員長

Dr. Timur ZHANTIKIN, Chairman of the Agency for Atomic Energy, the Republic of Kazakhstan



Peaceful Use of Nuclear Energy 原子力平和利用



Nonproliferation, Security, Safety 核不拡散、核セキュリティ、安全 (3S)

- Peaceful use of nuclear energy in equal basis
平等な原子力エネルギー利用
 - Non-proliferation, nuclear security and safety
3Sの確保
 - Economical, functional, industrial viability
経済的、機能的、産業成立性
 - Enhance reliability of international / regional community
国際・地域コミュニティの信頼性向上
- ↓
- International Cooperation towards Peaceful Use
平和利用促進への国際協力
 - Institutional system for 3S and Export Control Regime etc
3Sに係る国際制度、輸出管理体制等

International Efforts for Nuclear Non-proliferation

核不拡散・セキュリティへの国際取り組み

Realization of enhancement of nuclear non-proliferation and nuclear security by treaties and schemes (条約・協定等制度による核不拡散・セキュリティ強化)

Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

IAEA Comprehensive Safeguards Agreement
(Obligatory based on Article 3 of NPT)

IAEA Additional Protocol

Partial Test Ban Treaty (PTBT)

Convention on the Physical Protection of Nuclear Material

Convention for the Suppression of Acts of Nuclear Terrorism

Nuclear-Weapon-Free Zone Treaty

Comprehensive Test Ban Treaty (CTBT) still not enforced

Paving the way to commencement of negotiation for Fissile Material Cut-off Treaty (FMCT)

Supply-side approach (Non-proliferation according to conditions set by the supplying countries)

Demand-side approach (Measures to reduce incentives on the side of receiving countries)

Zangger Committee Nuclear power supplying country group (NSG):
London Guideline Nuclear exclusive and general-purpose goods and technologies

Measures for enhancement of non-proliferation by bilateral agreements

Multilateral Nuclear Approach including fuel supply guarantee (MNA)

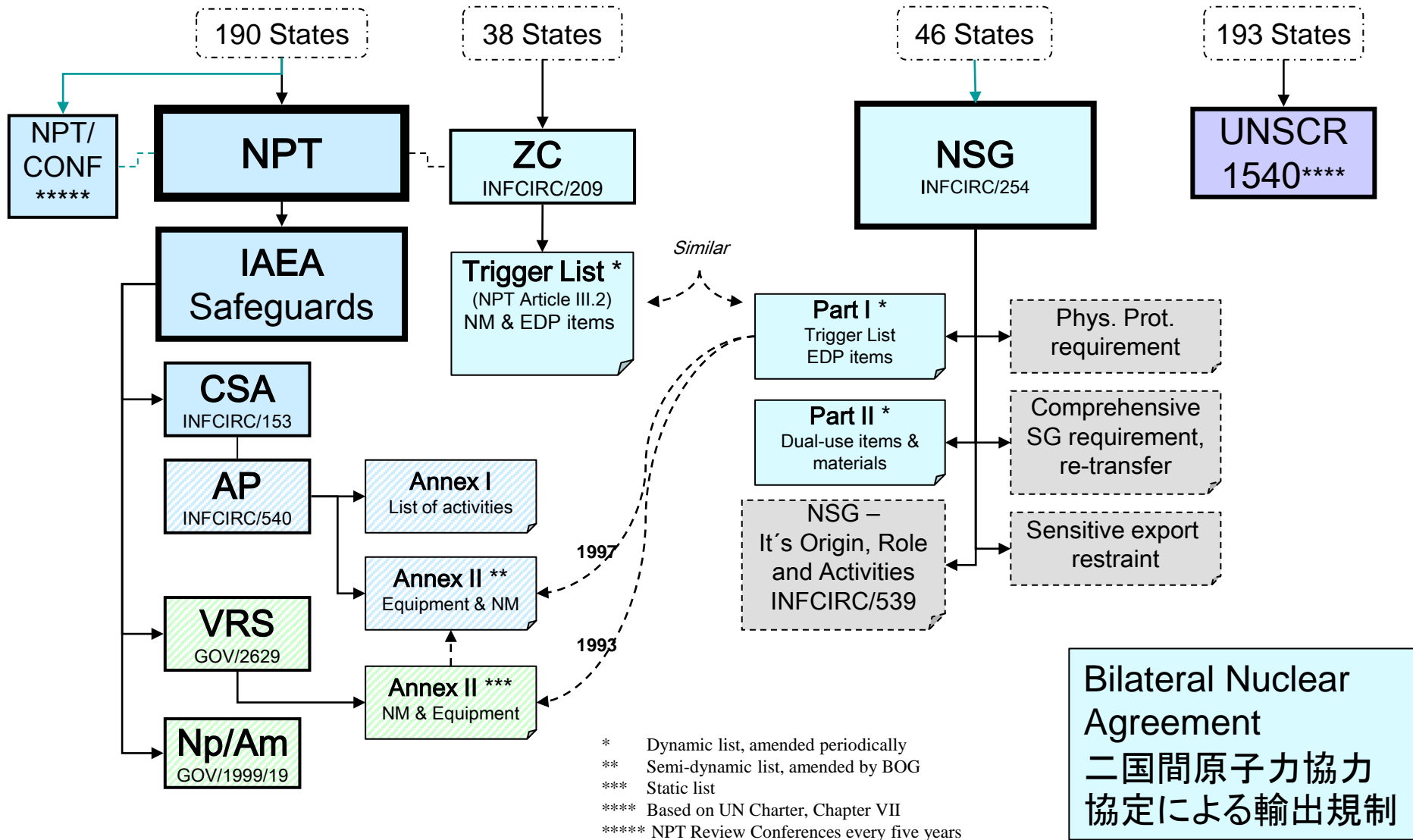
Other international agreements/cooperation

PSI, GTRI, UN Security Council Resolution 1540, etc.

Nuclear transfer control arrangements

原子力関連国際輸出管理

Supply-side approach



Demand-side approach

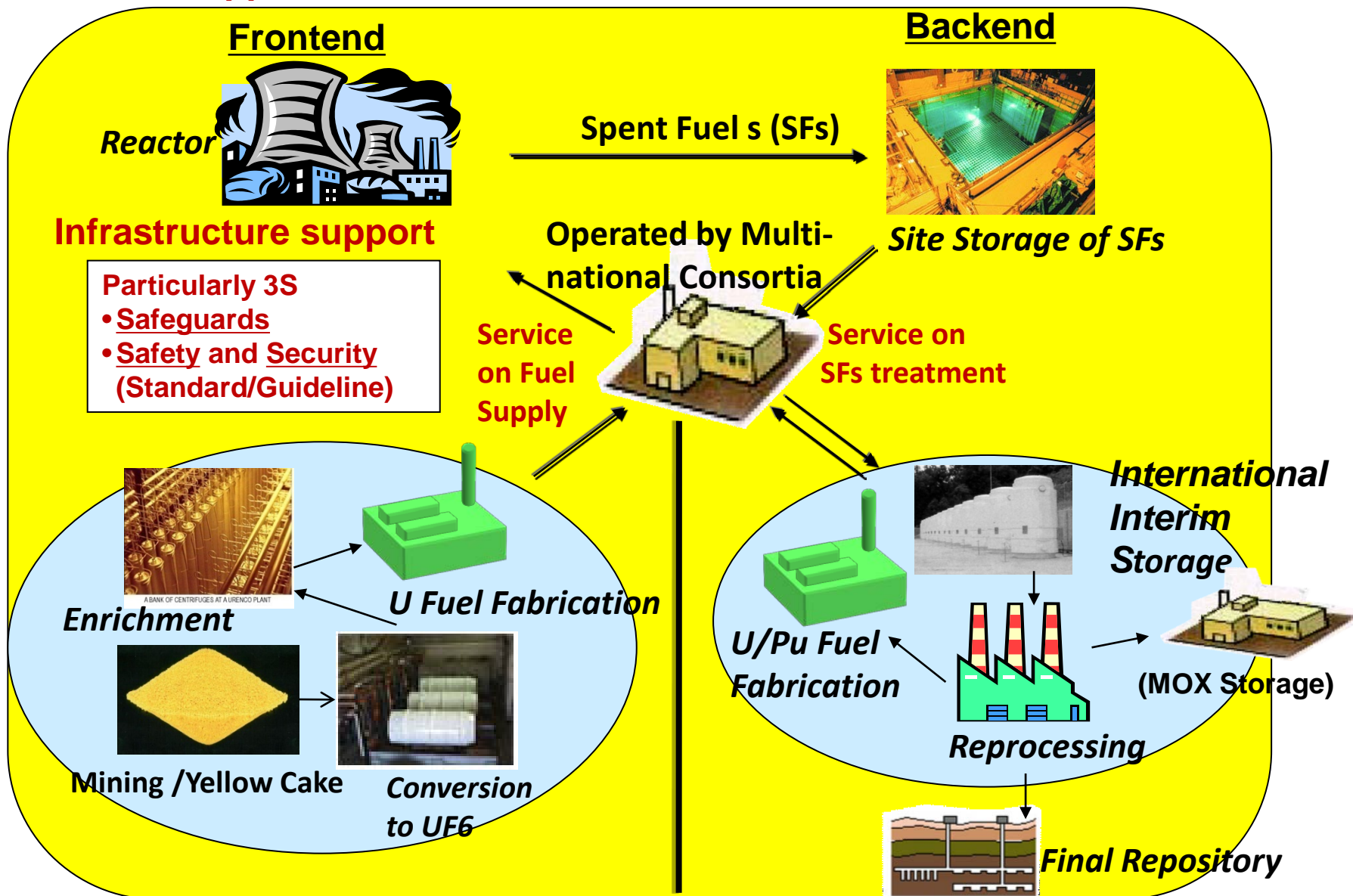
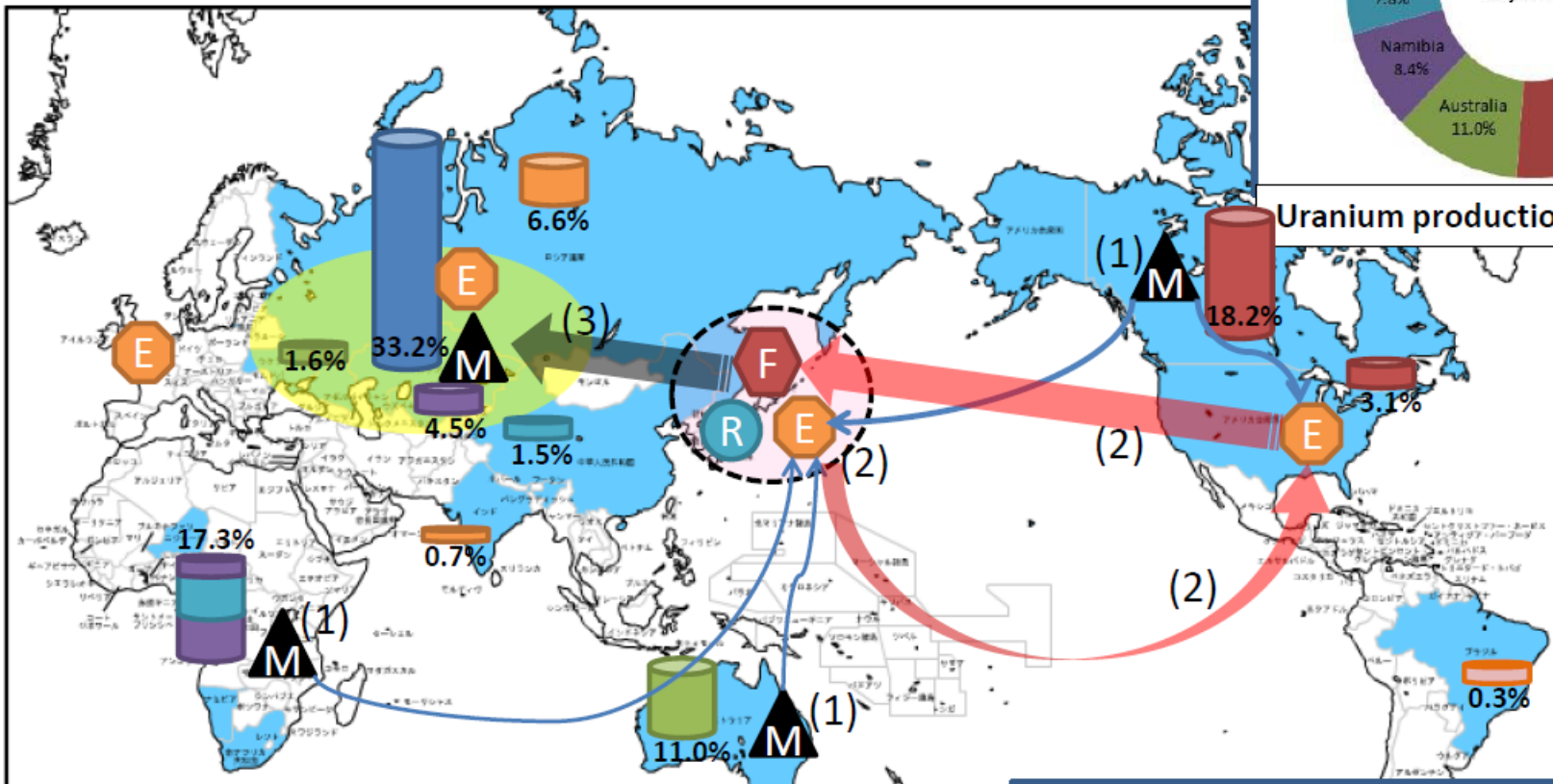
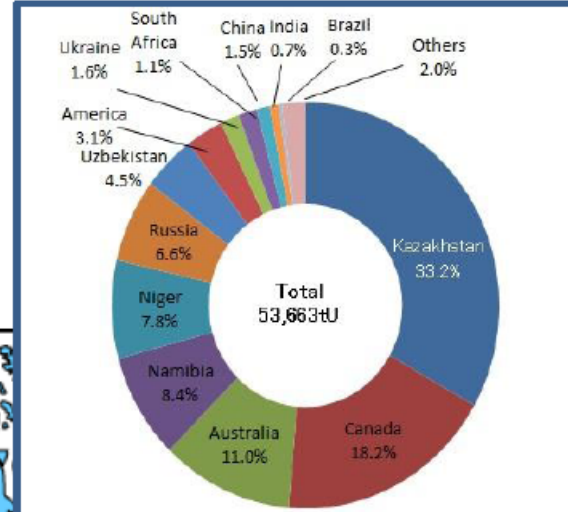


Image of Multilateral Nuclear Approach of NFC
核燃料サイクル多国間管理(イメージ例)

Nuclear Energy and geopolitics

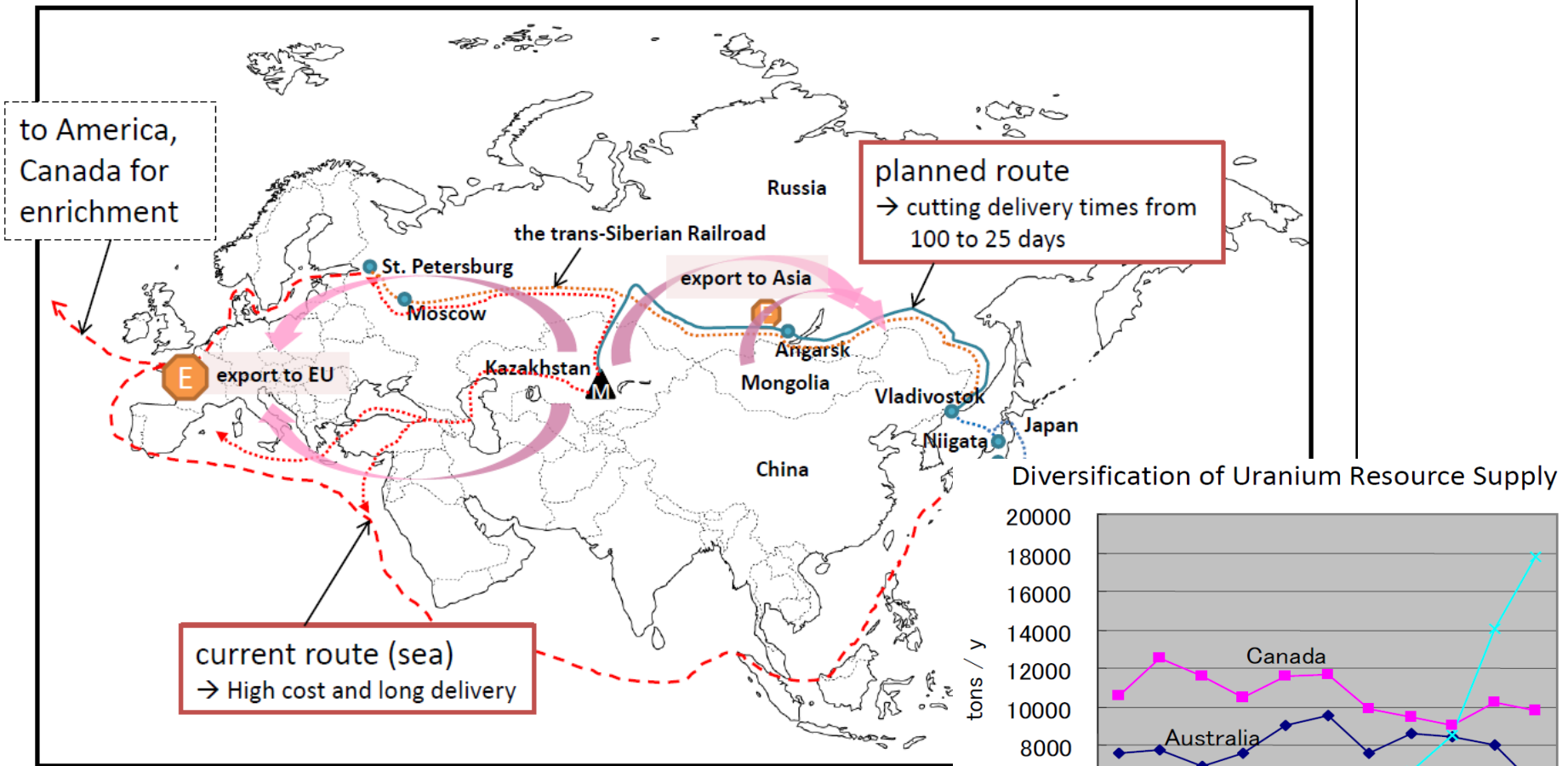
- (1) Japan imports most of uranium resources from Australia, Africa and Canada.
- (2) Enrichment of U-235 is processed mainly by plants in America (about 90%) and domestic about 10%.
- (3) Investigation for production and import of enriched uranium from Central Asia has been started. → Strategy of diversification of energy resource.



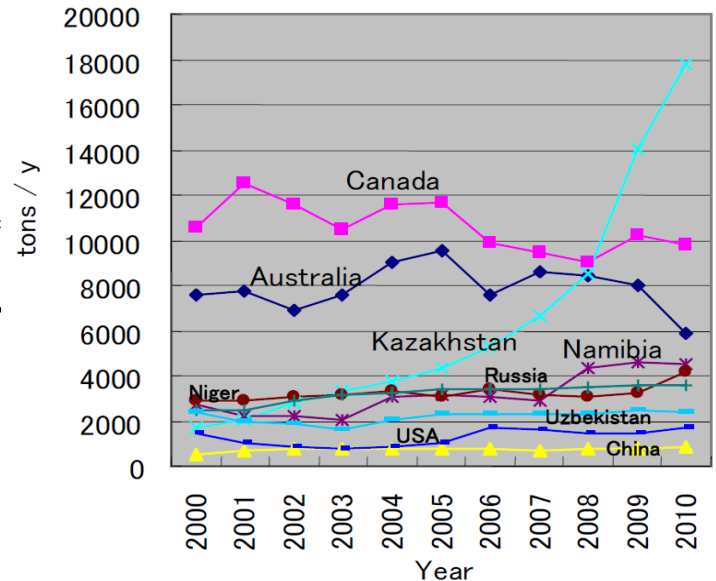
Note
Actual logistics might be different from contracts of uranium import.

Importance of relationship with Central Asia

-- current and planned transportation route of uranium

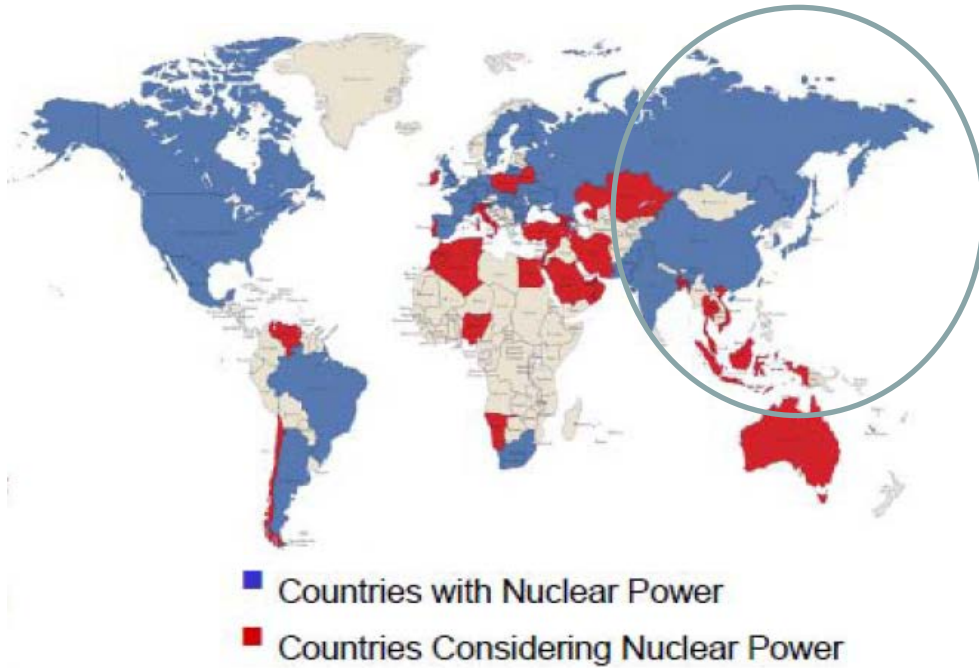


Diversification of Uranium Resource Supply

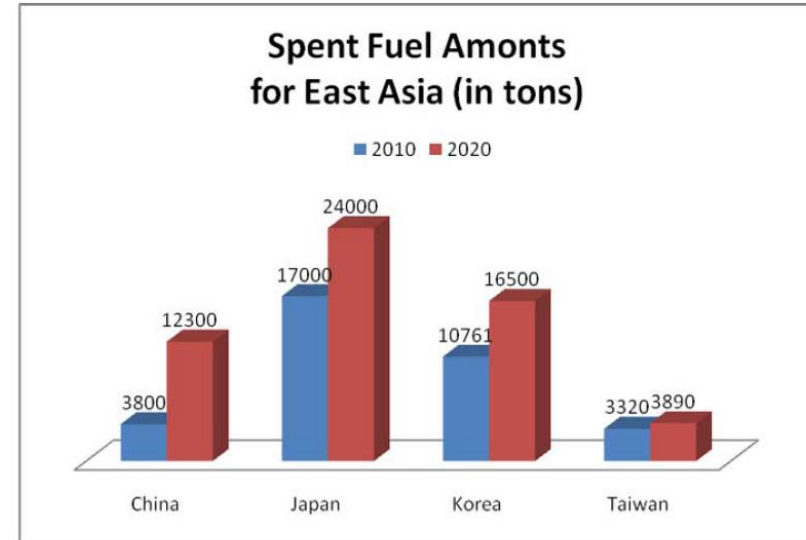


Data source: <http://www.world-nuclear.org/info/uprod.html>

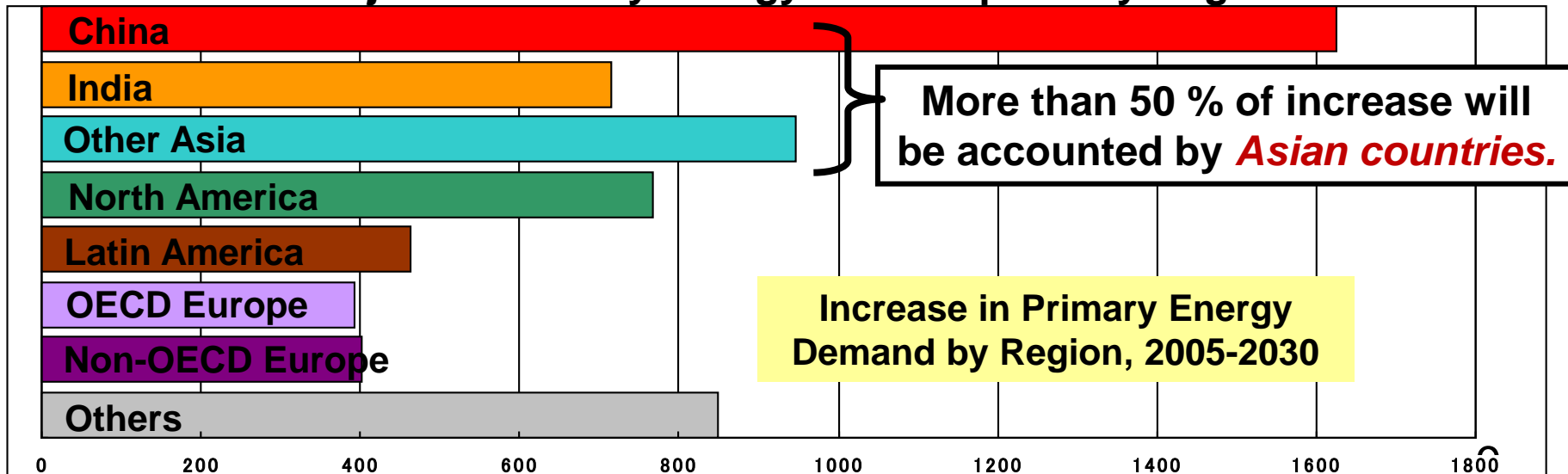
アジアにおける原子力事情 Nuclear Status in Asia Region



Current and Future Stockpiles in East Asia
http://www.japanfocus.org/-ferenc-dalnoki_veress/3376#



Projected Primary Energy Consumption by Region



Source: IEE Japan, November 2007 URL: <http://eneken.ieej.or.jp/en/data/pdf/405.pdf>

Toe: ton of oil equivalent

<論点 (Discussion Points) I>

- アジア地域における原子力利用を進める上で核拡散、核テロのリスクを低減する観点から、供給国側の視点で以下について議論

From supplier states' perspectives, following points will be discussed in the context of ensuring nuclear non-proliferation and nuclear security associated with the expansion of nuclear energy use in the Asian region.

- アジア地域の原子力発電(バックエンド問題を含む)の現状と今後の見通しについて認識を共有(既存の原子力発電利用国、新興の原子力発電利用国)

Current status and future prospects of nuclear power generation in the Asian region (as an introductory remarks by either a chairperson or a Japanese expert).

- 各供給国の原子力輸出管理政策を議論(原子力資機材の輸出にあたって、受領国側に求める核不拡散、核セキュリティ担保措置)

Nuclear supplier states' nuclear export policies (Requirements for recipient states from nuclear non-proliferation and nuclear security viewpoints).

<論点 (Discussion Points) II>

- 各供給国による保障措置、核セキュリティに関する支援の取組みについて

Efforts by supplier states to help newcomer states in the region ensure safeguards and nuclear security

- 多国間枠組みの実現可能性(I)

Feasibility of establishing a multilateral cooperation framework (I)

- 地域的な3S(保障措置や核セキュリティを中心に)の枠組み

A regional framework ensuring “3S” (mainly safeguards and nuclear security)

- 供給国側、受領国側から見たメリット、デメリット

Merits and demerits for supplier and recipient states

- 枠組み参加を促すための誘因(3Sに係る地域協力枠組み)

Incentives encouraging voluntary participation in such regional framework on 3S

<論点(Discussion Points)II(続)>

- 多国間枠組みの実現可能性(II)

Feasibility of establishing a multilateral cooperation framework (II)

- 地域的な燃料サイクルの枠組み(フロントエンド、バックエンド)

A regional nuclear fuel cycle framework (both front / back ends)

- アジアにおける多国間アプローチの意義

significance of multilateral approaches in the Asian region

- 供給国側、受領国側から見たメリット、デメリット

merits and demerits for supplier and recipient states

- 枠組みに参加を促すための誘因(ホスト国、参加国)incentives encouraging voluntary participation in such framework as well as hosting facilities

- 両者を統合したような構想

A regional framework integrating the above two concepts

- EURATOM(但し,現状では3Sで保障措置が主)のような地域枠組みの
アジアにおける実現可能性

Feasibility of establishing a framework in Asian region

論点I 議論における質問 Discussions and Q&A by all the panelists

Question 1:

アジアにおける原子力利用拡大における核不拡散および核セキュリティの懸念と課題、たとえば、供給国としてのサービス・支援における受領国への核不拡散・核セキュリティへの措置(輸出管理の重要性): How to deal with nuclear non-proliferation and nuclear security concerns and challenges associated with the expansion of the nuclear energy use in the Asian region.
Importance of nuclear export control and requirements for recipient states from nuclear non-proliferation and nuclear security viewpoints.

Question 2:

輸出管理における核不拡散、核セキュリティ担保措置、輸出管理や二国間協定などサプライサイドアプローチによる核不拡散対策の有効性と限界? Effectiveness and limitations of so-called “supply-side approaches” for ensuring nuclear non-proliferation and nuclear security measures, including nuclear export controls and bilateral nuclear cooperation agreements.

Question 3:

アジアにおける効果的な平和利用拡大および3S強化の両立策? 1つのオプションとして多国間管理:
Effective measures for enhancing peaceful use of nuclear energy and strengthening “3S” (safeguards, security and safety): Potentialities of a multilateral nuclear approach

燃料サイクル国際化について

Internationalization of Nuclear Fuel Cycle (I)

ウラン濃縮や再処理を含む平和利用拡大における核不拡散対策として、これまで国際社会は「保障措置」等制度の適用、および輸出管理による機微技術保有の制限「にて対応。

As measures for nuclear non-proliferation under expansion of peaceful use including enrichment and reprocessing of uranium, the international society has so far applied safeguards and limited holding of sensitive nuclear technologies (SNTs).

核拡散セキュリティ問題の深刻化、原子力利用の多様化から、国際社会は「核拡散抵抗性」などさらなる核不拡散対策の強化を要求している。

Because the situation of nuclear proliferation/security has been getting more serious, and diversification of nuclear energy, the international society is requiring more enhancement of the measures including the “nuclear proliferation resistance.”

一方で、それによる更なる経済的負担は、歓迎されるものではない。

On the other hand, it is not desirable to spend higher expense due to this.

そもそも、濃縮・再処理・国際貯蔵は世界にいくつかあればニーズはカバーできるという特徴がある。

In principle, the needs will be covered if there are some facilities in the world for enrichment, reprocessing, and international storage.

燃料サイクルの多国間管理について

Multilateralization of Nuclear Fuel Cycle (II)

そこで、新たな対策として「核燃料サイクルの多国間管理」の考え方が浮上。「多国間(国際)管理」は、国際的受容性のある解決策が提案できれば、経済的かつ効率的に、平和利用の促進+核不拡散が達成可能。

As a new measure, therefore, the idea of “Multilateral Nuclear Approach (MNA) of nuclear fuel cycle” has been emerging. If we can propose a solution that is internationally acceptable, the MNA of nuclear fuel cycle will economically and efficiently attain both fostering of peaceful use and nuclear non-proliferation.

まず、フロントエンド*について「核燃料の供給保証」など国際枠組みについて議論が進展(但し、多くの異なる提案が乱立) *原料採鉱・ウラン濃縮・燃料製造～原子力発電までを呼ぶ

First, as to the front end*, arguments about international frameworks such as “assuring of nuclear fuel supply” have been advanced (too many different proposals, though). *Stands for processes from raw material mining through uranium enrichment and fuel production to nuclear power generation.

しかし、同時に使用済み燃料取り扱いなどバックエンドへの対応問題が深刻化(多国における使用済み燃料の蓄積など)。バックエンドを含めた多国間管理が重要。

At the same time, however, the issues for responding to the back end including spent fuel treatment have been getting deeper (accumulation of spent fuel in countries). It is important to propose MNA including the back end.

さらに、安全、核セキュリティを含めた3Sの強化が平和利用の促進とともに望まれる。

Strengthening Safety, Security, Safeguards (3S) as well as promotion of peaceful use of Nuclear energy is desired.

核不拡散から考えた核燃料サイクル国際枠組みの検討-経緯

Time Chart of MNA Proposals, Initiatives, and Studies Relevant to Non-proliferation on NFC

- Multinational approaches on NFC
- Limiting enrichment & reprocessing
- Reliable fuel supply
- Regional spent fuel storage
- Regional fuel cycle center
- International control of technology & materials
- Export controls
- International safeguards
- Power Rx spent fuel take-back
- Research Rx spent fuel /materials take back

Reasons for no realization in the past

- Needs were premature, not critical yet.
- Regarded as double standard, unfairness, have and have not.
- Inconsistency with Market Mechanism
- Few proposal on fuel cycle backend

IAEA Expert Group INFCIRC/640
 NAS-RAS study on Int. NFC
 ElBaradei V. Reis, GNEP
 G. W. Bush E. Moniz

Committee Assurance of supply

WNA RANF, SA-RANF (Japan) MESP (Germany)

IMRSS, RSSFEA, Regional Compact
 PNC /IISS

- NTI Fuel Bank
- IUEC (Angarsk)
- 17.4 t US HEU bond (UK)

Baruch Plan

Uranium bank

Euratom

Zangger NSG

RFCC

INFCE

Int. Pu storage

INFCIRC /66

INFCIRC /153

INFCIRC /540

1946

1950

1960

1970

1980

1990

2000

USSR took back spent fuel from Soviet built reactors in Finland

Russia takes back spent fuel from FSRS now Eastern European countries

FRRSNFA, US takes back spent fuel from US origin research Rx

RRRFR, US supports Russia to take back spent fuel from Russian origin research Rx

Threat Reduction /GTRI

Proposals of Multilateral Approach (提案された多国間アプローチ)*

<i>2000s</i>	Proposer	Focus	Location	Standing	Timeframe
Regional Spent Fuel Storage Facilities (03)	IAEA	Back	Selected locations	Standing	Long-term
Multilateral Nuclear Approaches (05)	IAEA	Both	Selected locations	Standing	Long-term
Proposal on a reserve of nuclear fuel (05)	U.S.A.	Front		Backup	Short-term
GNEP (06)	U.S.A.	Back	Six fuel cycle states	Standing	Long-term
INFCC (06)	RF	Front		Backup	Short-term
Six Country Concept - enrichment (06)	Six suppliers	Front	Supplier states	Backup	Short-term
Enrichment Bond (06)	UK	Front		Backup	Short-term
Nuclear Fuel Bank (06)	NGO (NTI)	Front	Selected locations	Backup	Short-term
Standby Arrangement System (06)	Japan	Front	Selected locations	Both	Short-term
International Nuclear Fuel Bank (06)	IAEA	Front	Selected locations	Backup	Short-term
IUEC (07)	RF	Front	Selected locations	Standing	Mid-term
MESP (07)	Germany	Front	Extraterritorial	Standing	Mid-term

論点II 議論における質問 Discussions and Q&A by all the panelists

Question 1:

- ・アジアにおける多国間アプローチの意義？

Significances of multilateral approaches in Asian region.

Question 2:

- ・アジアにおけるバックエンドにおける多国間協力は可能か？

Is it possible to implement multilateral cooperation dealing with nuclear fuel cycle back end?

Question 3:

- ・多国間管理枠組みは経済的に成り立つか？ MNAやホスト国等の責任(賠償責任)は？

Is it economically possible to establish a MNA framework? Liability (MNA/host countries)?

Question 4:

- ・輸送の問題をどのように解決するか？

How to overcome inevitable challenges of transportation of nuclear materials and SNF?

論点II 議論における質問

Discussions and Q&A by all the panelists

・Question 5:

供給国側、受領国側から見たメリット、デメリット？参加へのインセンティブとは(国、産業界)？

Merits and demerits of participating in a MNA framework from nuclear supplier state /recipient state & nuclear supply industry' s viewpoints.
What is incentive to participate in MNA (States, Industries)?

Question 6:

株主(資金支援者)対技術保持者の関係はどうあるべきか。

What is relationship between share-holder and technology-holder?

Question 7:

•3Sの合理的な強化に向けた、先進国、新興国の協力体制ー3S統合アプローチとしての多国間協力

A nuclear cooperation framework consisting of both advanced and emerging nuclear energy states for strengthening “3S”. Multilateral cooperation as an integrated “3S” approach.

パネル2の質疑と全体まとめ

Questions from floor and summary of the panel discussion 2

- フロアからの質疑
- Questions from floor
- 議論のまとめ
- Summary of the panel discussion 2